



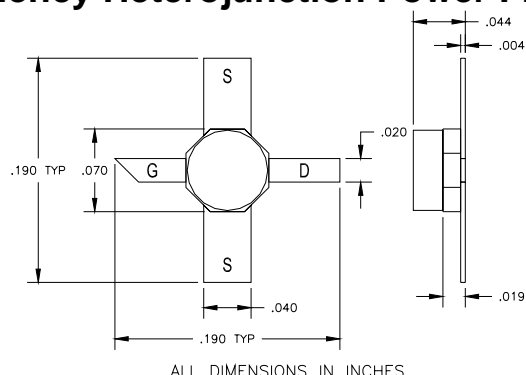
# EPA018B-70

ISSUED 11/01/2007

## High Efficiency Heterojunction Power FET

### FEATURES

- Non-Hermetic Low Cost Ceramic 70mil Package
- +20.0 dBm Output Power at 1dB Compression
- 11.0 dB Power Gain at 18GHz
- Typical 0.75 dB Noise Figure and 12.5 dB Associated Gain at 12GHz
- 0.3 x 180 Micron Recessed "Mushroom" Gate
- Si<sub>3</sub>N<sub>4</sub> Passivation
- Advanced Epitaxial Heterojunction Profile Provides Extra High Power Efficiency, and High Reliability



ALL DIMENSIONS IN INCHES

### ELECTRICAL CHARACTERISTICS (T<sub>a</sub> = 25°C)



Caution! ESD sensitive device.

SYMBOL	PARAMETERS/TEST CONDITIONS	MIN	TYP	MAX	UNITS
<b>P<sub>1dB</sub></b>	Output Power at 1dB Compression V <sub>DS</sub> = 6V, I <sub>DS</sub> ≈ 50% I <sub>DSS</sub> f = 12GHz f = 18GHz	18.5	20.0 20.0		dBm
<b>G<sub>1dB</sub></b>	Gain at 1dB Compression V <sub>DS</sub> = 6V, I <sub>DS</sub> ≈ 50% I <sub>DSS</sub> f = 12GHz f = 18GHz	11.0	13.5 11.0		dB
<b>PAE</b>	Power Added Efficiency at 1dB Compression V <sub>DS</sub> = 6V, I <sub>DS</sub> ≈ 50% I <sub>DSS</sub> f = 12GHz		45		%
<b>NF</b>	Noise Figure V <sub>DS</sub> = 2V, I <sub>DS</sub> = 15mA f = 12GHz		0.75		dB
<b>GA</b>	Associate Gain V <sub>DS</sub> = 2V, I <sub>DS</sub> = 15mA f = 12GHz		12.5		dB
<b>I<sub>DSS</sub></b>	Saturated Drain Current V <sub>DS</sub> = 3 V, V <sub>GS</sub> = 0 V	30	55	80	mA
<b>G<sub>M</sub></b>	Transconductance V <sub>DS</sub> = 3 V, V <sub>GS</sub> = 0 V	35	60		mS
<b>V<sub>P</sub></b>	Pinch-off Voltage V <sub>DS</sub> = 3 V, I <sub>DS</sub> = 1.0 mA		-1.0	-2.5	V
<b>BV<sub>GD</sub></b>	Drain Breakdown Voltage I <sub>GD</sub> = 1.0mA	-9	-15		V
<b>BV<sub>GS</sub></b>	Source Breakdown Voltage I <sub>GS</sub> = 1.0mA	-6	-14		V
<b>R<sub>TH</sub></b>	Thermal Resistance		480*		°C/W

Notes: \* Overall R<sub>th</sub> depends on case mounting.

### MAXIMUM RATINGS AT 25°C<sup>1,2</sup>

SYMBOL	CHARACTERISTIC	ABSOLUTE <sup>1</sup>	CONTINUOUS <sup>2</sup>
V <sub>DS</sub>	Drain to Source Voltage	12 V	6 V
V <sub>GS</sub>	Gate to Source Voltage	-6 V	-3 V
I <sub>DS</sub>	Drain Current	I <sub>DSS</sub>	40 mA
I <sub>GSF</sub>	Forward Gate Current	9 mA	1.5 mA
P <sub>IN</sub>	Input Power	16 dBm	@ 3dB compression
P <sub>T</sub>	Total Power Dissipation	285 mW	240 mW
T <sub>CH</sub>	Channel Temperature	175°C	150°C
T <sub>STG</sub>	Storage Temperature	-65/+175°C	-65/+150°C

1. Exceeding any of the above ratings may result in permanent damage.

2. Exceeding any of the above ratings may reduce MTTF below design goals.

Specifications are subject to change without notice.

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### S-PARAMETERS

6V,  $\frac{1}{2} I_{dss}$

FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.0	0.984	-19.0	5.081	162.1	0.014	75.9	0.813	-11.1
2.0	0.950	-38.2	4.859	144.2	0.026	63.4	0.789	-23.7
3.0	0.906	-56.4	4.547	127.3	0.035	51.4	0.766	-35.3
4.0	0.863	-74.0	4.348	111.9	0.041	42.1	0.745	-44.6
5.0	0.813	-90.7	4.195	97.2	0.047	32.9	0.713	-53.3
6.0	0.764	-105.0	3.973	82.9	0.049	24.2	0.675	-64.4
7.0	0.715	-120.3	3.746	68.8	0.050	15.3	0.649	-74.6
8.0	0.663	-134.7	3.572	55.9	0.046	6.9	0.612	-82.6
9.0	0.614	-157.7	3.501	41.4	0.044	5.6	0.605	-87.5
10.0	0.587	-179.9	3.388	26.4	0.044	2.1	0.585	-97.0
11.0	0.561	168.8	3.307	13.4	0.044	0.2	0.562	-110.8
12.0	0.539	153.6	3.248	0.0	0.045	2.0	0.551	-122.8
13.0	0.573	127.2	3.097	-15.8	0.049	-0.6	0.527	-131.9
14.0	0.611	104.9	2.873	-31.1	0.050	-6.1	0.510	-143.2
15.0	0.613	90.9	2.805	-46.4	0.055	-13.0	0.513	-162.9
16.0	0.620	74.4	2.730	-62.7	0.059	-20.7	0.503	178.0
17.0	0.640	58.9	2.432	-76.4	0.056	-20.7	0.463	169.1
18.0	0.692	49.7	2.365	-87.1	0.075	-32.3	0.522	157.0
19.0	0.691	32.0	2.236	-104.4	0.064	-49.1	0.540	133.7
20.0	0.731	16.7	2.163	-120.6	0.064	-59.8	0.591	117.3
21.0	0.783	7.8	2.061	-134.9	0.065	-70.3	0.578	106.6
22.0	0.771	-2.6	1.923	-148.7	0.062	-85.6	0.592	95.6
23.0	0.752	-20.8	1.800	-166.5	0.058	-103.2	0.592	76.9
24.0	0.776	-37.7	1.693	174.8	0.054	-123.0	0.584	59.7
25.0	0.756	-48.6	1.690	160.0	0.055	-139.5	0.568	45.9
26.0	0.742	-62.4	1.710	144.5	0.060	-154.9	0.555	33.7

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2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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